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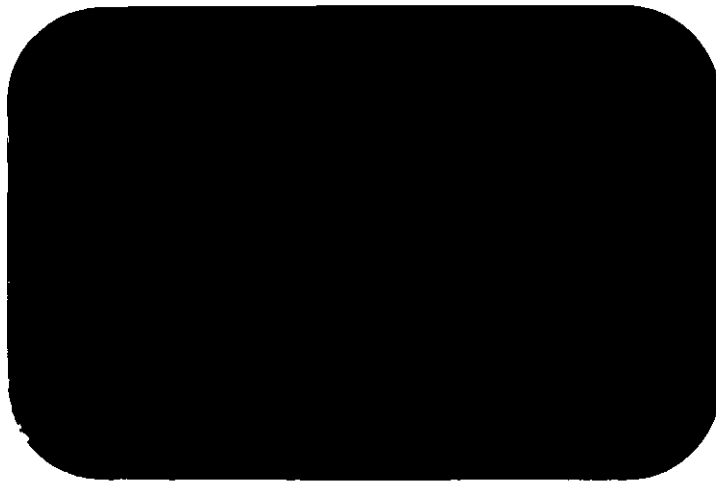
Division WASTE MANAGEMENT

Section SUPERFUND

Program IHS (IHS)

DocCat FACILITY

**T.R.
Edgerton,
Inc.**

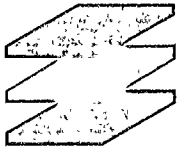


Addendum
Environmental Sub-Surface
Investigation
Annandale Corp. Site

Prepared for
Worth Chemical Corp.
Greensboro, NC

Prepared by
T. R. Edgerton, Inc.
Cary, NC

March 27, 1987



102 Woodwinds Industrial Court
Suite F
Cary, North Carolina 27511
919/469-9795

T.R. Edgerton, Inc.
*Environmental
Consultants*

March 27, 1987

Mr. Calvin Lynch
Vice-President
Worth Chemical Corp.
P.O. Box 20725
Greensboro, NC 27420

Re: Addendum to Environmental Sub-Surface Investigation -
Annandale Corporation Site, T. R. Edgerton, Inc.
Job #1052-086-004

Dear Mr. Lynch:

T. R. Edgerton, Inc. is pleased to submit this addendum to the
"Environmental Sub-Surface Investigation..." report submitted to you and
Worth Chemical Corporation on February 25, 1987.

INTRODUCTION

T. R. Edgerton, Inc. was requested by Worth Chemical Corp. after a
thorough review of the February 25, 1987 report titled "Environmental
Sub-Surface Investigation Annandale Corporation Site" to perform
additional sampling of soils on said property and extensive resampling
of ground-water monitor wells.

OBJECTIVES

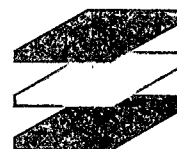
The objectives of the additional soil sampling was to further define sources of potential heavy metal contamination. Extensive ground-water monitor well sampling was performed to further define if any impact on ground water underlying the said site.

Soil Sampling

Soil sampling was conducted on 3/11/87. Locations of soil sampling are shown in Figure 1. Sampling techniques followed guidelines found in EPA guidelines document EPA-600/2-80-018. Briefly soil samples (AN-4, AN-S, BG) were collected at surface using previously decontaminated stainless steel spoons. Soil samples AN-1, AN-2, AN-3 were collected at depth of 6-12 inches using a previously decontaminated stainless steel auger.

Ground-Water Monitor Well Sampling

Ground-water monitoring well sampling was conducted on 3/11/87 and 3/17/87. Sampling procedures and monitor well evacuation and development followed procedures found in (1) "Manual of Ground-Water Quality Sampling Procedures" USEPA, 1981; (2) "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document", USEPA, September, 1986; (3) Guidance Document - August 22, 1985 NC office Solid and Hazardous Waste "An Approved RCRA Ground-Water Sampling and Analysis Plan".



Briefly, 3-5 well volumes were removed from each well before each sampling event using a teflon bailer. Samples were collected from each well for the metals arsenic, barium, cadmium, chromium, lead, nickel, selenium and zinc and inorganic parameter phenol. Additional samples were collected from rinses of bailers used for sampling and distilled water used for rinsing of the bailers. Samples were collected, split into two fractions and analyzed by two independent laboratories.

Throughout sampling and testing procedures, chain-of-custody was adhered too. Copies of the chain-of-custody are found in the appendices.

Chemical Testing

Inorganic parameters (metals, cyanide, phenol) followed methods found in (1) "Methods for Chemical Analysis of Water and Waste" EPA-600/4-79-020; and (2) "Test Methods for Evaluating Solid Waste" EPA SW-846.

CHEMICAL TESTING RESULTS

Soils

The heavy metal barium, was detected at levels above background at sample points AN-1, AN-2 and AN-5. All other parameters were detected at background levels. Results for soil sampling is found in the appendices section.



Ground-Water Monitoring Results

Barium was detected in all wells from both laboratories and both sampling occasions. Lead was detected in wells AB-1 and AB-3 by Environmental Testing on the 3/11/87 sampling event and well AB-1 on the 3/17/87 sampling event. Chemical & Environmental Technology detected lead on sampling event 3/11/87 in wells AB-2 and AB-3 and well AB-1 on the 3/17/87 sampling event. Nickel was detected by Chemical & Environmental Technology in all wells but AB-2 on both sampling events.

DISCUSSION OF RESULTS

Soils-Chemical Testing

The heavy metal contaminant Barium was detected above background levels at soil sampling points AN-1, AN-2 and AN-4. This indicates that sources of Barium contamination is from both railroad activity and fill dirt used in building construction. It must be noted that there does not exist on site by soil testing any contaminants considered to be hazardous under 42USC9601 (RCRA) or 42USC9601 (CERCLA).

Ground-Water Chemical Testing

The heavy metal barium was detected on all wells from all sampling events by both laboratories performing the analytical testing. The discrepancies between laboratories on measurable levels is possibly due to the high content of silty material contained in samples AB-1 and AB-3 submitted to Environmental Testing. Testing results can be found in the



appendices section and Table 1-4. Table 5 is a listing of contaminant levels by well and sampling event with bailer blank concentration subtracted. The mean and standard deviation is included for each element where significant.

CONCLUSIONS

Exhaustive testing of ground-water monitor wells on the Annandale property site indicate as discussed in the February 25, 1987 report that ground water underlying this site has been impacted. Potential sources of contamination to groundwater may possibly be able to attribute to railroad activity and the introduction on-site of fill material during construction of the current manufacturing facility. Several possible other sources of contamination may exist. These sources are off property migration of waste onto property or leachability of underlying rock to groundwater.

Levels of contaminants identified in soil indicates that no hazardous constituents under 42USC9601 (RCRA) or 42USC9601 (CERCLA) exist on site.

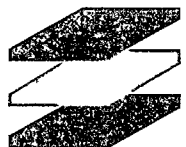
T. R. EDGERTON, INC.



Thomas R. Edgerton, FAIC, CPC
Senior Consultant



Brent Chambers
Project Manager/Geologist



Tables

Table 1
Testing Results
Ground-water Monitor Wells
Environmental Testing
Results in mg/L
3/11/87 Sampling

<u>Parameter</u>	<u>Distilled H₂O</u>	<u>AB-1</u>	<u>Blank</u>	<u>AB-2</u>	<u>Blank</u>	<u>AB-3</u>	<u>Blank</u>
Arsenic	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Barium	<0.050	3.220	<0.050	1.523	<0.050	5.550	<0.050
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead	<0.010	0.014	<0.010	<0.010	<0.010	0.024	0.012
Nickel	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Selenium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.076	<0.010	0.079	0.015	0.073	0.028	0.079
Phenols	<0.050	0.079	<0.050	<0.050	0.063	<0.050	<0.050

[illegible][illegible]

Table 3
 Testing Results
 Ground-water Monitor Wells
 Chemical & Environmental Technology
 Results in mg/L
 3/11/87 Sampling

<u>Parameter</u>	<u>Distilled H₂O</u>	<u>AB-1</u>	<u>Blank</u>	<u>AB-2</u>	<u>Blank</u>	<u>AB-3</u>	<u>Blank</u>
Arsenic	0.001	0.004	0.002	<0.003	0.002	<0.028	0.003
Barium	0.05	1.26	<0.01	1.12	<0.01	1.30	<0.01
Cadmium	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001
Chromium	0.027	0.040	0.017	0.028	<0.001	0.060	0.007
Lead	0.023	0.036	<0.037	0.040	0.031	0.056	0.024
Nickel	<0.001	0.032	<0.001	0.005	<0.001	0.098	<0.001
Selenium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.073	0.032	<0.071	0.031	0.074	0.075	0.100
Phenols	<0.001	0.011	<0.004	0.010	0.005	<0.001	<0.001

Table 5
Monitor Wells - Statistical
Elevations*
3/11/87 Sampling Results in mg/L

<u>Parameter</u>	<u>AB-1</u>			<u>AB-2</u>			<u>AB-3</u>		
	<u>X</u>	<u>S.D.</u>	<u>Range</u>	<u>X</u>	<u>S.D.</u>	<u>Range</u>	<u>X</u>	<u>S.D.</u>	<u>Range</u>
Arsenic	NS	NS	0.004-<0.010	NS	NS	0.001-<0.010	NS	NS	<0.010-0.0025
Barium	2.24	1.39	1.26-3.22	1.32	0.29	1.12-1.523	3.43	3.01	1.30-5.55
Cadmium	NS	NS	<0.001-<0.005	NS	NS	<0.001-<0.005	NS	NS	0.003-<0.005
Chromium	NS	NS	<0.010-0.23	NS	NS	<0.010-0.028	NS	NS	<0.010-0.053
Lead	NS	NS	<0.001-0.014	NS	NS	<0.010-0.009	NS	NS	0.012-0.032
Nickel	NS	NS	<0.015-0.032	NS	NS	0.005-<0.015	NS	NS	<0.015-0.098
Selenium	NS	NS	<0.001-<0.005	NS	NS	<0.001-<0.005	NS	NS	<0.001-<0.005
Zinc	NS	NS	<0.010	NS	NS	<0.010	NS	NS	<0.010
Phenols	0.043	0.051	0.007-0.079	NS	NS	<0.050-0.005	NS	NS	<0.001-0.013

3/17/87 Sampling Results in mg/L

<u>Parameter</u>	<u>AB-1</u>			<u>AB-2</u>			<u>AB-3</u>		
	<u>X</u>	<u>S.D.</u>	<u>Range</u>	<u>X</u>	<u>S.D.</u>	<u>Range</u>	<u>X</u>	<u>S.D.</u>	<u>Range</u>
Arsenic	NS	NS	<0.01-0.05	NS	NS	0.010	NS	NS	<0.010-0.014
Barium	2.456	1.98	1.06-3.856	1.476	0.35	1.23-1.721	3.211	3.14	.99-5.432
Cadmium	NS	NS	0.001-<0.005	NS	NS	<0.005	NS	NS	<0.005
Chromium	NS	NS	<0.010-0.012	NS	NS	<0.010-0.011	NS	NS	<0.010-0.013
Lead	0.030	0.018	0.017-0.043	NS	NS	<0.001-<0.010	NS	NS	<0.001
Nickel	NS	NS	<0.001-0.054	NS	NS	<0.001-<0.010	0.031	0.027	0.012-0.050
Selenium	NS	NS	<0.001	NS	NS	<0.001	NS	NS	<0.001
Zinc	NS	NS	<0.010-0.032	NS	NS	<0.010-0.0	NS	NS	<0.010-0.030
Phenols	NS	NS	<0.001	NS	NS	<0.050	NS	NS	<0.050

*Well data - both laboratories - blank subtracted
NS - Not significant

Soil Test Results



Chemical & Environmental Technology, Inc.

ENVIRONMENTAL LABORATORY SERVICES

JOHN M. OGLE
PRESIDENT

P. O. BOX 12298
RESEARCH TRIANGLE PARK, N. C. 27709
PHONE (919) 467.3090

Mr. Tom Edgerton
T. R. Edgerton, Inc.
P. O. Box 1307
Cary, North Carolina 27511

March 23, 1987

Reference: Purchase Order Number 1052-004

Dear Mr. Edgerton:


Enclosed you will find the results of the samples submitted to us for chemical analysis. If any part of the analysis data is missing in this report, please be assured that you will receive it very shortly.

All your samples for each and all of the constituents of interest have been analyzed using EPA recommended procedures. If an EPA method was not available, then the method included in "Standard Methods for Water and Wastewater" was used. Additionally, all EPA approved QA/QC protocols were strictly followed during your sample analyses. It is our policy to store such QA/QC data in our files and make them available to our clients for a nominal charge, upon request.

We appreciate your trust with the submitted sample(s) for chemical analysis and hope we will be of service to you in the very near future. If you have any questions regarding this report, do no hesitate to let us know.

Very sincerely yours,

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.


A. D. Shendrikar, PhD
Technical Director

ADS/gw

Enclosures: Sample History
Analytical Results



Chemical & Environmental Technology, Inc.

ENVIRONMENTAL LABORATORY SERVICES

JOHN M. OGLE
PRESIDENT

P. O. BOX 12298
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Mr. Tom Edgerton
T. R. Edgerton, Inc.
P. O. Box 1307
Cary, North Carolina 27511

March 23, 1987

Reference: Purchase Order Number 1052-004

SAMPLE HISTORY

<u>CLIENT ID</u>	<u>C & ET SAMPLE</u>	<u>DATE RECEIVED</u>	<u>DATE ANALYZED</u>
AN-1	6636	3/12/87	3/13/87 to 3/23/87
AN-2	6637	3/12/87	3/13/87 to 3/23/87
AN-3	6638	3/12/87	3/13/87 to 3/23/87
AN-4	6639	3/12/87	3/13/87 to 3/23/87
AN-5	6640	3/12/87	3/13/87 to 3/23/87
BG	6641	3/12/87	3/13/87 to 3/23/87

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 23, 1987

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ANALYTICAL RESULTS

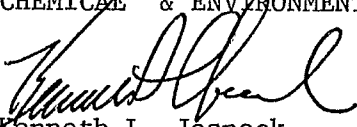
<u>PARAMETER</u>	<u>METHOD</u> ¹	<u>AN-1</u>	<u>AN-2</u>	<u>AN-3</u>
Arsenic	206.2	0.16	0.35	0.10
Barium	208.1	64.3	118	27.9
Chromium	218.1	0.28	0.81	0.30
Lead	239.1	0.48	1.53	1.24
Nickel	249.1	0.33	0.56	< 0.01
Zinc	289.1	0.37	1.05	0.28
Cyanide	335.2	< 0.01	< 0.01	< 0.01
Solids, Percent	160.6	84.4	82.5	85.9

<u>PARAMETER</u>	<u>METHOD</u> ¹	<u>AN-4</u>	<u>AN-5</u>	<u>BG</u>
Arsenic	206.2	0.59	0.85	0.30
Barium	208.1	84.5	19.1	20.4
Chromium	218.1	0.48	1.02	0.60
Lead	239.1	1.59	2.86	3.51
Nickel	249.1	0.88	0.28	0.18
Zinc	289.1	1.49	1.15	1.40
Cyanide	335.2	< 0.01	< 0.01	< 0.01
Solids, Percent	160.6	78.3	78.1	76.4

All result units expressed in mg/kg dry weight except Solids, Percent...%

¹"Methods for Chemical Analysis of Water and Wastes," EPA 600/4-79-020.

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.


Kenneth L. Jesneck
Lab Manager

KLJ/gw

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 23, 1987

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QUALITY CONTROL DATA

ARSENIC

Single Injection Analysis

QC Known Recovery 113%, 102%, 93.7%: Average = 102.9%

BARIUM

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.078	0.6%	101%
Digested Blank	0.016	8.7%	0.10mg/L
Blank	0.015	9.4%	0.08mg/L
Digested Known	0.151	6.5%	96.6%
AN-1	0.062	2.1%	
AN-2	0.152	3.0%	
AN-3	0.075	6.2%	
AN-4	0.019	0.6%	
AN-5	0.002	0.2%	
BG	0.075	8.3%	
Known	0.484	11.2%	102%

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 23, 1987

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CHROMIUM

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.013	7.0%	92.7%
Digested Blank	0.013	99.9% ¹	0.003mg/L
Blank	0.012	99.9% ¹	0.004mg/L
Digested Known	0.023	5.9% ¹	95.1%
AN-1	0.020	99.9% ¹	
AN-2	0.013	36.7% ¹	
AN-3	0.019	99.9% ¹	
AN-4	0.016	83.3%	
AN-5	0.017	41.9%	
BG	0.009	34.3%	
Known	0.013	6.5%	98%

¹ Contains a negative reading - sample at or above detection limit.

LEAD

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.016	7.8%	101%
Digested Blank	0.007	33.4%	0.010mg/L
Blank	0.008	26.3%	< 0.001mg/L
Digested Known	0.009	2.0%	107%
AN-1	0.002	8.8%	
AN-2	0.010	15.4%	
AN-3	0.005	8.4%	
AN-4	0.001	1.9%	
AN-5	0.011	9.7%	
BG	0.022	14.7%	
Known	0.007	3.4%	105%

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 23, 1987

NICKEL

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.007	7.2%	103%
Digested Blank	0.002	99.9%	< 0.001mg/L
Blank	0.003	55.3%	0.005mg/L
Digested Known	0.007	7.2%	121%
AN-1	0.002	15.1%	
AN-2	0.004	18.9%	
AN-3	0.002	23.2%	
AN-4	0.003	8.3%	
AN-5	0.001	10.9%	
BG	0.002	25.6%	
Known	0.007	6.5%	102%

ZINC

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.008	3.7%	105%
Digested Blank	0.001	43.7%	0.001mg/L
Blank	0.000	99.9%	< 0.001mg/L
Digested Known	0.008	1.9%	105%
AN-1	0.000	2.5%	
AN-2	0.001	3.2%	
AN-3	0.000	2.6%	
AN-4	0.001	1.4%	
AN-5	0.001	1.9%	
BG	0.000	0.6%	
Known	0.001	0.3%	102%

Ground-water Test Results



environmental testing inc.

March 19, 1987

SAMPLES

6

COLLECTION DATE

Noted Below

1. distilled water (3-11-87)
2. AB-1 (3-11-87)
3. AB-1 Bailer Blank (3-11-87)
4. AB-2 (3-11-87)
5. AB-2 Bailer Blank (3-11-87)
6. AB-3 (3-11-87)

Mr. T. R. Edgerton
T. R. Edgerton, Inc.
102 F Woodwinds Industrial
Court
Cary, NC 27511

Page 1 of 3

Storet Number	PARAMETERS Results in MG/L unless otherwise noted	1	2	3	4	5	6
00310	BOD5 @ 20°C						
00340	COD @ 0.25N K2Cr2O7						
50060	Chlorine, Total Residual						
00720	Cyanide, Total (CN)						
31616	Fecal Coliform, #/100 ml						
00951	Fluoride, Total (F)						
38260	MBAS, (Detergents)						
00610	Nitrogen, Ammonia, Total						
00625	Nitrogen, Kjeldahl, Total						
00620	Nitrogen, Nitrate, (Brucine)						
00556	Oil & Grease						
00400	pH (Standard Units)						
32730	Phenols	<0.050	0.079	<0.050	<0.050	0.063	<0.050
00665	Phosphorus, Total (P)						
00500	Residue, Total						
00530	Residue, Total Nonfilterable						
50086	Settleable Matter (ML/L/Hour)						
00076	Turbidity, (NTU)						
Storet Number	METALS Results in µG/L						
01105	Aluminum, Total (Al)						
01002	Arsenic, Total (As)	<10	<10	<10	<10	<10	<10
01007	Barium, Total (Ba)	<50	3220	<50	1523	<50	5550
01027	Cadmium, Total (Cd)	<5	<5	<5	<5	<5	<5
01034	Chromium, Total (Cr)	<10	<10	<10	<10	<10	<10
01042	Copper, Total (Cu)						
01045	Iron, Total (Fe)						
01051	Lead, Total (Pb)	<10	14.3	<10	<10	<10	24.3
71900	Mercury, Total (Hg)						
01067	Nickel, Total (Ni)	<15	<15	<15	<15	<15	<15
01147	Selenium, Total (Se)	<5	<5	<5	<5	<5	<5
01077	Silver, Total (Ag)						
01092	Zinc, Total (Zn)	76	<10	79	15	73	28



environmental testing inc.

March 19, 1987

SAMPLES 6 COLLECTION DATE Noted Below

1. AB-3 Bailer Blank (3-11-87)
2. distilled water (3-17-87)
3. AB-1 (3-17-87)
4. AB-1 Bailer Blank (3-17-87)
5. AB-2 (3-17-87)
6. AB-2 Bailer Blank (3-17-87)

Mr. T. R. Edgerton
T. R. Edgerton, Inc.
102 F Woodwinds Industri-
al Court
Cary, NC 27511

Page 2 of 3

Storet Number	PARAMETERS Results in MG/L unless otherwise noted	1	2	3	4	5	6
00310	BOD5 @ 20°C						
00340	COD @ 0.25N K2Cr2O7						
50060	Chlorine, Total Residual						
00720	Cyanide, Total (CN)						
31616	Fecal Coliform, #/100 ml						
00951	Fluoride, Total (F)						
38260	MBAS, (Detergents)						
00610	Nitrogen, Ammonia, Total						
00625	Nitrogen, Kjeldahl, Total						
00620	Nitrogen, Nitrate, (Brucine)						
00556	Oil & Grease						
00400	pH (Standard Units)						
32730	Phenols	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
00665	Phosphorus, Total (P)						
00500	Residue, Total						
00530	Residue, Total Nonfilterable						
50086	Settleable Matter (ML/L/Hour)						
00076	Turbidity, (NTU)						
Storet Number	METALS Results in µG/L						
01105	Aluminum, Total (Al)						
01002	Arsenic, Total (As)	<10	<10	<10	<10	<10	<10
01007	Barium, Total (Ba)	<50	<50	3856	<50	1721	<50
01027	Cadmium, Total (Cd)	<5	<5	<5	<5	<5	<5
01034	Chromium, Total (Cr)	<10	<10	<10	<10	<10	<10
01042	Copper, Total (Cu)						
01045	Iron, Total (Fe)						
01051	Lead, Total (Pb)	11.5	<10	17.3	<10	<10	12.0
71900	Mercury, Total (Hg)						
01067	Nickel, Total (Ni)	<15	<15	27	40	15	37
01147	Selenium, Total (Se)	<5	<5	<5	<5	<5	<5
01077	Silver, Total (Ag)						
01092	Zinc, Total (Zn)	79	<10	<10	<10	<10	<10



environmental testing inc.

March 19, 1987

SAMPLES 2 COLLECTION DATE Noted below

1. AB-3 (3-17-87)
2. AB-3 Bailer Blank (3-17-87)

Mr. T. R. Edgerton
T. R. Edgerton, Inc.
102 F Woodwinds Industri-
al Court
Cary, NC 27511

Page 3 of 3

Storet Number	PARAMETERS Results in MG/L unless otherwise noted	1	2				
00310	BOD5 @ 20°C						
00340	COD @ 0.25N K2Cr2O7						
50060	Chlorine, Total Residual						
00720	Cyanide, Total (CN)						
31616	Fecal Coliform, #/100 ml						
00951	Fluoride, Total (F)						
38260	MBAS, (Detergents)						
00610	Nitrogen, Ammonia, Total						
00625	Nitrogen, Kjeldahl, Total						
00620	Nitrogen, Nitrate, (Brucine)						
00556	Oil & Grease						
00400	pH (Standard Units)						
32730	Phenols	<0.050	<0.050				
00665	Phosphorus, Total (P)						
00500	Residue, Total						
00530	Residue, Total Nonfilterable						
50086	Settleable Matter (ML/L/Hour)						
00076	Turbidity, (NTU)						
Storet Number	METALS Results in µG/L						
01105	Aluminum, Total (Al)						
01002	Arsenic, Total (As)	<10	<10				
01007	Barium, Total (Ba)	5432	<50				
01027	Cadmium, Total (Cd)	<5	<5				
01034	Chromium, Total (Cr)	<10	<10				
01042	Copper, Total (Cu)						
01045	Iron, Total (Fe)						
01051	Lead, Total (Pb)	11.3	14.7				
71900	Mercury, Total (Hg)						
01067	Nickel, Total (Ni)	27	15				
01147	Selenium, Total (Se)	<5	<5				
01077	Silver, Total (Ag)						
01092	Zinc, Total (Zn)	<10	<10				

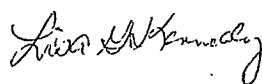
The following is a list of standards that were run with your well samples.

<u>Parameter</u>	<u>Conc.</u>					<u>Units</u>
Phenol	0.1	0.2	0.5	0.8	1.0	mg/l
Cd,Cr,Ni,Zn		0.25	0.5	1.0	2.0	mg/l
Ba		0.5	1.0	2.5		mg/l
As		10.0	20.0	40.0		ug/l
Se		5.0	10.0	20.0		ug/l
Pb		10.0	20.0	40.0		ug/l

The following is a list of the Quality control data that was run with your well samples.

<u>Parameter</u>	<u>% Recovery</u>	
	<u>03-11-87</u>	<u>03-17-87</u>
As	107	98
Ba	123	120
Cd	84	108
Cr	95	97
Pb	85	85
Ni	97	103
Se	96	113
Zn	98	94
Phenol	102	102

Respectfully submitted,



Lisa G. Kennedy
Biologist

LGK/sjd



Chemical & Environmental Technology, Inc.

ENVIRONMENTAL LABORATORY SERVICES

JOHN M. OGLE
PRESIDENT

P. O. BOX 12298
RESEARCH TRIANGLE PARK, N. C. 27709
PHONE (919) 467-3090

Mr. Tom Edgerton
T. R. Edgerton, Inc.
P. O. Box 1307
Cary, North Carolina 27511

March 24, 1987

Reference: Purchase Order Number 1052-004

Dear Mr. Edgerton:

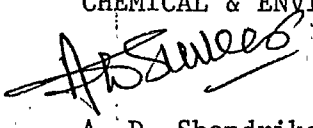
Enclosed you will find the results of the samples submitted to us for chemical analysis. If any part of the analysis data is missing in this report, please be assured that you will receive it very shortly.

All your samples for each and all of the constituents of interest have been analyzed using EPA recommended procedures. If an EPA method was not available, then the method included in "Standard Methods for Water and Wastewater" was used. Additionally, all EPA approved QA/QC protocols were strictly followed during your sample analyses. It is our policy to store such QA/QC data in our files and make them available to our clients for a nominal charge, upon request.

We appreciate your trust with the submitted sample(s) for chemical analysis and hope we will be of service to you in the very near future. If you have any questions regarding this report, do no hesitate to let us know.

Very sincerely yours,

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.


A. D. Shendrikar, PhD
Technical Director

ADS/gw

Enclosures: Sample History
Analytical Results



Chemical & Environmental Technology, Inc.

ENVIRONMENTAL LABORATORY SERVICES

JOHN M. OGLE
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Page 2 of 7

Mr. Tom Edgerton
T. R. Edgerton, Inc.
P. O. Box 1307
Cary, North Carolina 27511

March 24, 1987

Reference: Purchase Order Number 1052-004

SAMPLE HISTORY

<u>CLIENT ID</u>	<u>C & ET SAMPLE</u>	<u>DATE RECEIVED</u>	<u>DATE ANALYZED</u>
AB - 1	6712	3/17/87	3/18/87 to 3/23/87
Bailer AB-1*	6713	3/17/87	3/18/87 to 3/23/87
AB-2	6714	3/17/87	3/18/87 to 3/23/87
Bailer AB-2*	6715	3/17/87	3/18/87 to 3/23/87
AB-3	6716	3/17/87	3/18/87 to 3/23/87
Bailer AB-3*	6717	3/17/87	3/18/87 to 3/23/87
DI H ₂ O	6718	3/17/87	3/18/87 to 3/23/87

*Note: Bottle markings conflict with Chain-of-Custody.



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Page 3 of 7

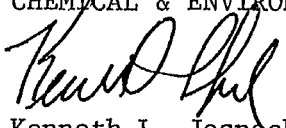
Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 24, 1987

ANALYTICAL RESULTS

PARAMETER	METHOD	Bailer		Bailer	
		AB - 1	AB - 1	AB - 2	AB - 2
Arsenic	206.2	0.006	0.001	0.002	0.001
Barium	208.1	1.06	< 0.01	1.23	< 0.01
Cadmium	213.1	0.003	< 0.001	0.002	< 0.001
Chromium	218.1	0.029	0.017	0.021	0.010
Lead	239.1	0.050	0.007	< 0.001	< 0.001
Nickel	249.1	0.054	< 0.001	< 0.001	< 0.001
Selenium	270.2	< 0.001	< 0.001	0.001	0.001
Zinc	289.1	0.038	0.006	0.037	0.003
Phenol	420.1	< 0.001	0.004	0.007	0.004

PARAMETER	METHOD	Bailer		DI H ₂ O
		AB - 3	AB - 3	
Arsenic	206.2	0.016	0.002	0.001
Barium	208.1	0.99	< 0.01	< 0.01
Cadmium	213.1	0.004	0.002	0.002
Chromium	218.1	0.033	0.020	0.012
Lead	239.1	< 0.001	< 0.001	< 0.001
Nickel	249.1	0.050	< 0.001	< 0.001
Selenium	270.2	0.003	0.001	< 0.001
Zinc	289.1	0.038	0.007	0.008
Phenol	420.1	0.002	< 0.001	< 0.001

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.


Kenneth L. Jesneck
Lab Manager

KLJ/gw



Chemical & Environmental Technology, Inc.

ENVIRONMENTAL LABORATORY SERVICES

JOHN M. OGLE
PRESIDENT

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RESEARCH TRIANGLE PARK, N. C. 27709
PHONE (919) 467-3090

Page 4 of 7

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 24, 1987

Quality Control Data

ARSENIC

Single Injection Analysis
Known Standard Recovery = 113%, 102%, 112%, 106%

SELENIUM

Single Injection Analysis
Known Standard Recovery = 108%, 104%, 90.0%

BARIUM

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.167	1.4%	103%
Digested Blank	0.018	20.5%	< 0.01mg/L
Blank	0.005	20.0%	< 0.01mg/L
Digested Known	0.012	0.6%	83.2%
AB-1	0.058	2.8%	
Bailer AB-1	0.010	25.0%	
AB-2	0.045	1.8%	
Bailer AB-2	0.004	8.6%	
AB-3	0.025	1.3%	
Bailer AB-3	0.018	99.9%	
DI H ₂ O	0.015	68.5%	
Known	0.378	97.3%	

CADMIUM

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.005	2.8%	93.1%
Digested Blank	0.005	26.1%	<< 0.001mg/L
Blank	0.003	20.0%	< 0.001mg/L
Digested Known	0.003	0.8%	96.5%
AB-1	0.001	26.3%	
Bailer AB-1	0.001	99.9%	
AB-2	0.000	11.2%	
Bailer AB-2	0.000	30.1%	
AB-3	0.001	16.3%	
Bailer AB-3	0.000	9.3%	
DI H ₂ O	0.001	23.1%	
Known	0.005	2.6%	105%

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 24, 1987

Page 5 of 7

CHROMIUM

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.009	4.4%	100%
Digested Blank	0.007	37.6%	0.010mg/L
Blank	0.019	99.9%	< 0.001mg/L
Digested Known	0.014	3.4%	104%
AB-1	0.003	4.8%	
Bailer AB-1	0.008	24.7%	
AB-2	0.007	17.1%	
Bailer AB-2	0.002	11.5%	
AB-3	0.005	6.9%	
Bailer AB-3	0.000	0.4%	
DI H ₂ O	0.004	18.2%	
Known	0.014	7.1%	98.5%

LEAD

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.003	1.6%	108%
Digested Blank	0.011	23.1%	< 0.001mg/L
Blank	0.004	8.4%	< 0.001mg/L
Digested Known	0.014	3.9%	89.1%
AB-1	0.003	3.20%	
Bailer AB-1	0.027	99.9%	
AB-2	0.003	12.8%	
Bailer AB-2	0.008	25.4%	
AB-3	0.008	8.1%	
Bailer AB-3	0.005	21.5%	
DI H ₂ O	0.017	29.4%	
Known	0.009	4.5%	96.5%

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 24, 1987

Page 6 of 7

NICKEL

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.007	7.2%	103%
Digested Blank	0.002	99.9%	< 0.001mg/L
Blank	0.003	55.3%	0.001mg/L
Digested Known	0.004	0.8%	121%
AB-1	0.010	9.1%	
Bailer AB-1	0.003	39.3%	
AB-2	0.002	99.9%	
Bailer AB-2	0.004	99.9%	
AB-3	0.009	9.6%	
Bailer AB-3	0.005	27.7%	
DI H ₂ O	0.003	38.7%	
Known	0.009	10.2%	87.0%

ZINC

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.008	3.7%	105%
Digested Blank	0.001	43.7%	0.001mg/L
Blank	0.000	99.9%	< 0.001mg/L
Digested Known	0.008	1.9%	105%
AB-1	0.001	1.4%	
Bailer AB-1	0.001	11.4%	
AB-2	0.002	2.5%	
Bailer AB-2	0.001	28.5%	
AB-3	0.001	1.6%	
Bailer AB-3	0.000	2.6%	
DI H ₂ O	0.001	3.9%	
Known	0.001	0.5%	106%



Chemical & Environmental Technology, Inc.

ENVIRONMENTAL LABORATORY SERVICES

JOHN M. OGLE
PRESIDENT

P. O. BOX 12298
RESEARCH TRIANGLE PARK, N. C. 27709
PHONE (919) 467.3090

Mr. Tom Edgerton
T. R. Edgerton, Inc.
P. O. Box 1307
Cary, North Carolina 27511

March 24, 1987

Reference: Purchase Order Number 1052-004

Dear Mr. Edgerton:

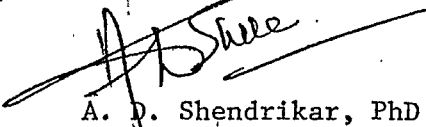
Enclosed you will find the results of the samples submitted to us for chemical analysis. If any part of the analysis data is missing in this report, please be assured that you will receive it very shortly.

All your samples for each and all of the constituents of interest have been analyzed using EPA recommended procedures. If an EPA method was not available, then the method included in "Standard Methods for Water and Wastewater" was used. Additionally, all EPA approved QA/QC protocols were strictly followed during your sample analyses. It is our policy to store such QA/QC data in our files and make them available to our clients for a nominal charge, upon request.

We appreciate your trust with the submitted sample(s) for chemical analysis and hope we will be of service to you in the very near future. If you have any questions regarding this report, do not hesitate to let us know.

Very sincerely yours,

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.


A. D. Shendrikar, PhD
Technical Director

ADS/gw

Enclosures: Sample History
Analytical Results



Chemical & Environmental Technology, Inc.

ENVIRONMENTAL LABORATORY SERVICES

JOHN M. OGLE
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P. O. BOX 12298
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PHONE (919) 467-3090

Page 2 of 7

Mr. Tom Edgerton
T. R. Edgerton, Inc.
P. O. Box 1307
Cary, North Carolina 27511

March 24, 1987

Reference: Purchase Order Number 1052-004

SAMPLE HISTORY

<u>CLIENT ID</u>	<u>C & ET SAMPLE</u>	<u>DATE RECEIVED</u>	<u>DATE ANALYZED</u>
AB-1	6642	3/12/87	3/14/87 to 3/23/87
Bailer AB-1*	6643	3/12/87	3/16/87 to 3/23/87
AB-2	6644	3/12/87	3/16/87 to 3/23/87
Bailer AB-2*	6645	3/12/87	3/16/87 to 3/23/87
AB-3	6646	3/12/87	3/16/87 to 3/23/87
Bailer AB-3*	6647	3/12/87	3/16/87 to 3/24/87
DI H ₂ O	6648	3/12/87	3/16/87 to 3/24/87

*Bottle markings conflict with Chain-of-Custody.

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 24, 1987

Page 3 of 7

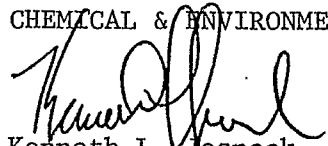
ANALYTICAL RESULTS					
PARAMETER	METHOD ¹	AB-1	BAILER AB-1	AB-2	BAILER AB-2
Arsenic	206.2	0.004	0.002	0.003	0.002
Barium	208.1	1.26	< 0.01	1.12	< 0.01
Cadmium	213.1	< 0.001	< 0.001	0.001	< 0.001
Chromium	218.1	0.040	0.017	0.028	< 0.001
Lead	239.1	0.036	0.037	0.040	0.031
Nickel	249.1	0.032	< 0.001	0.005	< 0.001
Selenium	270.2	< 0.001	< 0.001	< 0.001	< 0.001
Zinc	289.1	0.032	0.071	0.031	0.074
Phenol	420.1	0.011	0.004	0.010	0.005

PARAMETER	METHOD ¹	AB-3	BAILER AB-3	DI H ₂ O
Arsenic	206.2	0.028	0.003	0.001
Barium	208.1	1.30	< 0.01	0.05
Cadmium	213.1	0.003	< 0.001	< 0.001
Chromium	218.1	0.060	0.007	0.027
Lead	239.1	0.056	0.024	0.023
Nickel	249.1	0.098	< 0.001	< 0.001
Selenium	270.2	< 0.001	< 0.001	< 0.001
Zinc	289.1	0.075	0.100	0.073
Phenol	420.1	< 0.001	< 0.001	< 0.001

All result units expressed in mg/L.

¹"Method for Chemical Analysis of Water and Wastes," EPA 600/4-79-020.

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.


Kenneth L. Jesneck
Lab Manager

KLJ/gw

QUALITY CONTROL DATA

ARSENIC

Single Injection Analysis

Known Standard Recovery = 113%, 102%, 112%, 106%

SELENIUM

Single Injection Analysis

Known Standard Recovery = 90.3%, 86.1%, 108%, 104%

BARIUM

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.078	0.6%	101%
Digested Blank	0.016	8.7%	0.10mg/L
Blank	0.015	9.4%	0.08mg/L
Digested Known	0.151	6.5%	96.6%
AB-1	0.093	3.7%	
Bailer AB-1	0.056	99.9%	
AB-2	0.037	1.6%	
Bailer AB-2	0.021	99.9%	
AB-3	0.116	4.5%	
Bailer AB-3	0.046	99.9%	
DI H ₂ O	0.034	33.6%	
Known	0.508	4.3%	100%

CADMIUM

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.005	2.8%	93.1%
Digested Blank	0.005	26.1%	< 0.001mg/L
Blank	0.003	20.0%	< 0.001mg/L
Digested Known	0.003	0.8%	96.5%
AB-1	0.003	13.3%	
Bailer AB-1	0.002	26.6%	
AB-2	0.004	99.9%	
Bailer AB-2	0.001	77.0%	
AB-3	0.003	40.4%	
Bailer AB-3	0.001	99.9%	
DI H ₂ O	0.000	7.8%	
Known	0.001	0.4%	102%

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 24, 1987

Page 5 of 7

CHROMIUM

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.013	7.0%	92.7 %
Digested Blank	0.013	99.9%	0.003mg/L
Blank	0.012	99.9%	0.004mg/L
Digested Known	0.023	5.9%	95.1 %
AB-1	0.011	13.3%	
Bailer AB-1	0.016	48.5%	
AB-2	0.016	29.0%	
Bailer AB-2	0.021	99.9%	
AB-3	0.003	2.7%	
Bailer AB-3	0.014	99.9%	
DI H ₂ O	0.025	47.5%	
Known	0.003	1.3%	108%

LEAD

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.016	7.8%	101%
Digested Blank	0.007	33.4%	0.010mg/L
Blank	0.008	26.3%	< 0.001mg/L
Digested Known	0.009	2.0%	107%
AB-1	0.017	24.5%	
Bailer AB-1	0.011	15.2%	
AB-2	0.014	18.1%	
Bailer AB-2	0.012	18.8%	
AB-3	0.016	14.7%	
Bailer AB-3	0.007	14.2%	
DI H ₂ O	0.002	4.3%	
Known	0.009	4.8%	90.1 %

Mr. Tom Edgerton
T. R. Edgerton, Inc.
March 24, 1987

Page 6 of 7

NICKEL

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.007	7.2%	103%
Digested Blank	0.002	99.9%	< 0.001mg/L
Blank	0.003	55.3%	< 0.005mg/L
Digested Known	0.004	0.8%	121%
AB-1	0.001	0.9%	
Bailer AB-1	0.007	80.8%	
AB-2	0.004	37.3%	
Bailer AB-2	0.009	99.9%	
AB-3	0.003	1.5%	
Bailer AB-3	0.003	10.2%	
DI H ₂ O	0.003	20.5%	
Known	0.009	10.2%	87.0%

<u>SAMPLE</u>	<u>RUN STANDARD DEVIATION</u>	<u>RELATIVE STANDARD DEVIATION</u>	<u>% RECOVERY OR CONCENTRATION</u>
Known	0.008	3.7%	105%
Digested Blank	0.001	43.7%	0.001mg/L
Blank	0.000	99.9%	< 0.001mg/L
Digested Known	0.008	1.9%	105%
AB-1	0.002	2.5%	
Bailer AB-1	0.000	0.2%	
AB-2	0.001	2.0%	
Bailer AB-2	0.001	0.3%	
AB-3	0.002	1.5%	
Bailer AB-3	0.000	0.1%	
DI H ₂ O	0.001	0.6%	
Known	0.001	0.5%	103%

Chain-of-Custody

T. R. Edgerton, Inc.

**102 F Woodwinds
Industrial Court
Cary, NC 27511**

CHAIN OF CUSTODY RECORD

[illegible]

T. R. Edgerton, Inc.

**102 F Woodwinds
Industrial Court
Cary, NC 27511**

CHAIN OF CUSTODY RECORD

[illegible]

T. R. Edgerton, Inc.

**102 F Woodwinds
Industrial Court
Cary, NC 27511**

CHAIN OF CUSTODY RECORD

[illegible]

T. R. Edgerton, Inc.

**102 F Woodwinds
Industrial Court
Cary, NC 27511**

CHAIN OF CUSTODY RECORD

[illegible]

Figure

